to produce a selected function and wherein said selecting means does not require an articulated response from the user,

(c) identification means for identifying one or more said detected stimuli as corresponding to said selected function for producing a function control signal,

(d) receiving means for receiving said function control signal for said controlling said computer operation.

REMARKS

Claims 1-2, 4, 9, 12, 15, 17-18, 21, 38, 40, 44-45, 51 and 55 remain in this application, with new Claims 67-70 having been added and with Claims 3, 5-8, 10-11, 13-14, 16, 20, 22-36, 49, 41-43, 46-50, 52-54 and 56-66 having been canceled to expedite the prosecution of this application. Claim 37 had been previously canceled. Claims 2, 4, 9, 12, 15, 17-18, 21, 38, 40, 44-45 have not been amended and are believed to be patentable for the reasons set forth below.

A Petition for a Third Month Extension of Time, up to and including October 13, 1999, was filed on September 29, 1999 in order to timely file this Continuing Prosecution Application and accompanying Preliminary Amendment.

35 U.S.C. §112, First Paragraph Rejection

In the final office action dated April 13, 1999, the Examiner rejected Claims 1 and 55 under 35 U.S.C. §112, first paragraph and takes the position that the specification of the present invention does not enable one skilled in the art to make/use the invention, with particular regard to a "stimuli input means for detecting at least one stimulus being caused by the at least one thought of the user."

Applicant has maintained throughout the prosecution of the present

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application that it _is_ known to those skilled in the art how to make/use such a stimuli input means. Enclosed herewith, as Exhibit A, is a declaration under 37 CFR §1.132 (hereinafter "Decl.") from the Applicant citing specific references _all of which are prior art references_ (and copies of each which are also enclosed as Exhibit B) that disclose how to make/use such stimuli input means. Decl. §10.

It should be understood that Applicant's invention is _not_ being able to "read a user's thoughts" as characterized by the Examiner. Rather, the Applicant's invention is the _combination_ of: (1) detecting those stimuli created by a user's thought related to computer control[1] (e.g., print a document, copy a file, etc.); (2) function selection means that receives these stimuli and comprises a memory that includes a correspondence between a plurality of previously-stored user stimuli and a plurality of desired functional control signals (e.g., print a document, copy a file, etc.); and (3) identification means, coupled to the function selection means, for comparing the stimuli to the correspondence and to identify the particular function control signal that is then transmitted to the computer to control it.

It is the Examiner's position that element number 1, i.e., detecting those stimuli created by a user's thought, is not known to those skilled in the art. However, detecting such stimuli, including both the apparatus and method to do so, are known in the art. See Decl. §§11-18.

Applicant's reference to Helmet mounted SQUIDs (p. 43 of A.S.N.

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[1]There are sufficient dipole stimuli which are voluntary to the user and have coordinates which are reliably distinguishable over the other thoughts. This is evidence by movements of a finger, foot and other body parts as evidence in papers from Bocker, Chayne and Walker.

08/835,625, as cited by the Examiner on p. 2 of the Office Action) does *not in any way* imply that detecting the stimuli created by a user's thought has not been achieved. On the contrary, as stated above, the ability to detect these stimuli is known by those skilled in the art. As can be seen from the text itself on p. 43[2], Applicant is explaining that: (1) the accuracy of localizing, i.e., being able to pinpoint the particular locations of stimuli generated by a user's thoughts will improve; and that (2) user mobility will improve, i.e., currently, the apparatus *that does detect these stimuli* is rather bulky/heavy but will advance so that the user's mobility will not be encumbered. In other words, the stimuli input means as set forth in Claims 1 and 55 (as well as new Claims 67-70) *does exist and is known to those skilled in the art.* In fact, a helmet mounted SQUID is addressed and illustrated in figures 1, 2 and 4 of the prior art reference by Riitta Hari, "Human cortical functions revealed by magnetoencephalography", Progress in Brain Research, Vol. 100, (1994), pp. 163-168; an elaboration on the subject of helmets is also discussed in the prior art reference D.M. Tucker, "Spatial sampling of head electrical fields: the geodesic sensor net, Electroencephalography and clinical Neurophysiology, Vol. 87 (1993) pp. 154-163.

Therefore, based on all of the foregoing, Applicant respectfully submits that the stimuli input means of the present invention is known in the art and that the Specification of A.S.N. 08/835,625 does comply with 35 U.S.C. §112, first paragraph. As a result, Applicant respectfully requests that the 35 U.S.C. §112, first paragraph rejection

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[2]   Helmet mounted SQUIDs, or an improvement thereof, will provide *better localization accuracy* and *user mobility* as technology advances. The helmet may have a small optical fiber cable connected to the user's chair or bed where signals are converted to higher outputs and forwarded to the main system. Some electronics today are proving that cryogenic cooling may not be necessary. The helmet itself may be used inside a shielded room, or the helmet could be used instead of a shielded room. Ultimately, a wireless system may be explored as technology grows. (emphasis added, A.S.N. 08/835,625, p. 43)

be withdrawn for Claims 1 and 55.

The Examiner further asserts that the present invention does not effectively differ from biofeedback devices.

Applicant wishes to clarify the difference between thought-invoked stimuli detection (the present invention) and biofeedback. Generally, biofeedback involves the user being presented with a display of his/her brain activity in certain environment (e.g., some type of stress-generating situation). The user then attempts to control his/her thinking, and ultimately his/her body operation, in order to *modify his/her displayed brain activity* (e.g., to relax in the stress-generated situation). Another example of this is where the biofeedback is used to have the user move a cursor on a screen. The cursor on the screen can be analogized to the "display of his/her brain activity". When the user tries to move that cursor from one location to another, he/she generates brain activity (e.g., the user thinks, "I want the cursor to go to the right.") and *then watches what the cursor does*. If the cursor moves in the desired direction, the user continues to "think" that way. If the cursor moves in an undesired direction, the user must *modify his/her brain activity* to somehow get the cursor to move properly. In other words, in biofeedback, the user is continuously responding to what he sees or hears, etc- i.e., what he/she sees or hears is driving the user's brain activity[3].

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[3]Biofeedback, as a brain body system is called, uses measuring equipment to define the state of the user, display a reference of the state which is in reality only known to the user, after which the user proceeds to attempt the change in his brain body state such that the measuring equipment will display the change to notify the user how the measuring equipment perceived the user's change. In time, some users are able to cause the measuring equipment's display to change that will not necessarily divulge or record the method he/she used to cause the change. There is never an attempt to have the user think of a specific thought which has been predefined and selected from specific unique stimuli to effect a specific control function.

On the other hand, the present invention detects the stimuli that correspond to a thought and operates the computer based on those detected stimuli. In particular, once the output from the stimuli input means are transmitted to the computer, the TCS software begins to create a database that stores various stimuli which is then associated with a designation. For example, the computer may display a label, or an image, e.g., the phrase "print a document", or a graphical depiction of a printer and a right hand moving the index finger may be displayed on the screen[4]. If the user wants to print a document then he/she consciously thinks "move the right index finger[5]". The stimuli input means then detects those stimuli from the brain that are active when the user consciously thinks about moving the right index finger. After doing this association[6] a few times for verification, the computer now has a reliable correspondence of the at least one stimuli with the command "print a document." Thus, whenever, the particular user is connected to the stimuli input means and thinks of "moving the right index finger", her/his brain will generate the at least one stimuli that will be detected by the stimuli input means and transmitted to the TCS.

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[4]"TCS provides for designations of the user's choice to be displayed or otherwise communicated to the user." (A.S.N. 08/835,625, p.30, lines 3-4).

[5]As discussed in detail above, and especially with reference to Bocker, K.B.E., et al. reference, this type of thought generates a stimuli pattern that can be detected. In particular, the Bocker et al. reference, the Cheyne '89 reference and the Cheyne '91 reference discuss finger movement potential that can be confirmed by a proceeding readiness potential. In general, Readiness Potential (RP) is approximately a one second slow moving recordable additional increase in potential prior to the brain's sending movement instructions to a body part.

[6]"Each stimulus or group of stimuli is identified with a unique designation so that the user can associate stimuli with his or her (related) thoughts." (A.S.N. 08/835,625, p. 30, lines 1-3); and
    Each tagged conditioned stimulus is communicated to the user for consideration and correlation with the user's perception of the stimulus origin."(A.S.N. 08/835,625, p. 41, lines 2-4); and
    Accordingly, progressive steps are taken toward assigning a conditioned stimulus to an operational function and recording them in stimulus profiles." (A.S.N. 08/835,625, p. 41, lines 10-11).

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The TCS software will then recognize the particular stimuli[7] as "print the document" and the TCS will respond by printing the document. Decl. §14. The key feature of the present invention is that the TCS is associating particular stimuli patterns of thoughts that can be reliably detected by prior art stimuli input means (discussed in Decl. §§11-18) with particular computer control commands and then implementing those commands. In fact, using Table 1 of Walter, if "moving the finger" were associated with printing a document, then the TCS would make the following association with the stimuli coordinates:

User's Thought	Stimuli Coordinates x(mm) y(mm) z(mm)	Function Designation
move finger	169.0 153.0 206.0	print a document

Thus, the stimuli input means of the TCS would detect *at those stimuli coordinates* the "thought: "move the finger" and would implement the function designation of print a document.

Thus Applicant respectfully submits that the present invention is significantly different from biofeedback. Decl. §19.

35 U.S.C. §103(a) Rejections

The Examiner has rejected Claims 1, 3-5, 7-17, 19-22, 24, 32-36, 38-41, 46-48, 51-63, 65 and 66 based on Junker in view of U.S. Patent No. 5,594,849 (Kuc et al., hereinafter "Kuc"). In particular, the Examiner states that Junker includes all of the elements of Claim 1 except for the magnetic source imaging means. To make up for that deficiency, the Examiner cites Kuc as providing such magnetic source imaging means and

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[7]During TCS operation, identification 306 compares each conditioned stimulus outputted from conditioning 303 with the conditioned stimuli in the profiles of function selection 304. When identification 306 finds a match, the associated function is sent via function control 307 to computer operation 301." (A.S.N. 08/835,625, p. 41, lines 11-15).

then combines these two references stating that since Junker "utilizes bio-imaging means to achieve its purposes, it [Junker] presents the perfect platform onto which an imaging system such as Kuc may be applied."

Applicant respectfully disagrees for the following reasons.

It should be understood that, as stated above and in Applicant's §1.132 declaration, that the stimuli input means is known in the art and that the TCS is not limited to magnetic source imaging (MSI). Decl. §20. Claims 1 and 55 have been amended accordingly. Thus, Kuc forms one of the stimuli input means known in the art. However, Junker does not use bio-imaging means nor make any reference to it; certainly Junker uses a display in his system but that does not form bio-imaging means. As stated previously, Junker is directed to the recognition that an aggregate signal of EEG and EMG biopotentials is necessary for proper feedback which is limited to interpreting frequency spectra detected on the body. Junker does not teach or even suggest implementing localization, i.e., determining coordinates of stimuli generated by the thoughts of the user, as is accomplished by the stimuli input means of the TCS which can be achieved using MSI, such as that suggested by Kuc. Thus, there is no incentive to even combine Junker with Kuc. Therefore, for all of the above reasons, including the reasons discussed in previous responses with respect to Junker, Applicant respectfully submits that amended Claims 1, 4, and 55, as well as Claims 9, 12, 15, 17, 21, 38, 40 and 51 are patentable over the art of record and respectfully request that the §103(a) rejection of Junker in view of Kuc be withdrawn.

The Examiner has rejected Claim 2 under 35 U.S.C. §103(a) as being unpatentable over Junker in view of Kuc as applied to Claim 1 and further in view of Thatte

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et al. However, for the same reasons that amended Claim 1 is patentable over the art of record, Claim 2 is respectfully submitted to be patentable thereover also.

The Examiner has rejected Claim 18 under 35 U.S.C. §103(a) as being unpatentable over Junker in view of Kuc as applied to Claim 1 and further in view of Hartzell et al. However, for the same reasons that amended Claim 1 is patentable over the art of record, Claim 18 is respectfully submitted to be patentable thereover also.

The Examiner has rejected Claims 44-45 under 35 U.S.C. §103(a) as being unpatentable over Junker in view of Kuc as applied to Claim 1 and further in view of Adachi. However, for the same reasons that amended Claim 1 is patentable over the art of record, Claims 44-45 are respectfully submitted to be patentable thereover also.

New Claims 67-70 have been added to more fully cover the scope of the invention. In particular, these claims specify that the stimuli input means detects stimuli from at least one user thought _pattern_ (Claim 67), from one or more thought _patterns_ in a user's body (Claim 68), from at least one user thought _category_ (Claim 69) and from one or more thought _categories_ in a user's body (Claim 70).

In view of the foregoing amendments and remarks, it is respectfully submitted that Claims 1-2, 4, 9, 12, 15, 17-18, 21, 38, 40, 44-45, 51, 55 and 67-70 now appearing in this application are allowable and such favorable action is respectfully requested.

Respectfully submitted,

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